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(54) **Fastener for Garment**

(57) A fastener used with a disposable diaper (1), comprises a hook member (13) and a loop member (14), the hook member (13) comprises of a base sheet (16) and hooks (17) extending in a vertical direction from the top surface of the base sheet (16). The back surface of the base sheet (16) has a bonded region (20) and non-bonded region (18) with respect to the diaper (1) and the non-bonded region (18) is defined towards the one end from which the hook member (13) can be progressively released from the loop member (14) toward the other opposite end.

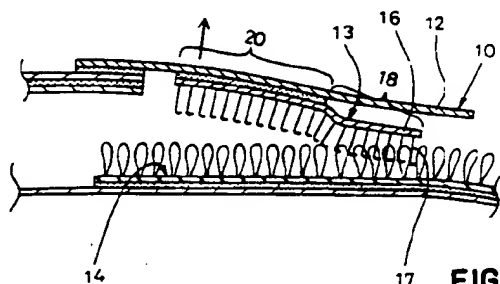


FIG.4

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Description

The present invention relates to a fastener used for a garment such as a disposable diaper or a diaper cover.

As a fastener for a garment of this type, what is called a tape fastener has conventionally been used, which comprises a combination of a hook member and a loop member and commonly known under the trade name 'Velcro Tape' or 'Magic Tape'. With this fastener hooks and loops of both members extending substantially in vertical direction are brought into a mechanical engagement as the hook member and the loop member are put one upon another.

Figs. 5 and 6 of the accompanying drawings are side views illustrating a manner in which hooks 17 on a hook member 13 are engaged with loops 25 on a loop member 14. Referring to Fig. 5, the hook member 13 is engaged with the loop member 14 as the hook member 13 is put on the loop member 14 in a direction as indicated by an arrow A and released therefrom as the hook member 13 is pulled vertically as indicated by an arrow B. Referring now to Fig. 6, these two members 13, 14 are tensioned, when they are pulled in horizontally opposite directions as indicated by arrows C, D from their mutually engaged states as illustrated by Fig. 5. Fig. 6 reveals that many of the hooks 17 are positively brought into engagement with the corresponding loops 25. In the state illustrated by Fig. 5 on the other hand, the hooks 17 are merely inserted into spaces defined among the loops 25 and only a few of the hooks 17 are in engagement with the corresponding loops 25. As a consequence, the hook member 13 can be easily released from the loop member 14 as the hook member 13 are pulled upward from the loop members 14.

With respect to such a fastener, Japanese Laid-Open Patent Application No. Hei4-276251 discloses that a loop member may be intermittently bonded to a garment to facilitate many of hooks to be caught by corresponding loops as a hook member is horizontally pulled.

With a garment put on a wearer and fastened by engaging a hook member with a loop member of a fastener, the hook member is sometimes released from the loop member due to a vertically oriented force tending to release the hook member from the loop member carelessly exerted on the fastener. To avoid such a situation, there is always a demand for a fastener so improved that, with a garment put on a wearer, a mutual engagement of these two members can not be easily released simply by an unintentional movement of the hook member in the direction vertical to the loop member but released only by positively pulling the hook member in the vertical direction when it is desired to take off the garment from the wearer. While the previously mentioned Laid-Open Patent Application No. Hei4-276251 discloses a means ensuring a hook member and a loop member to be engaged with each other as the hook member is moved in a horizontal direction

relatively to the loop member, none of means is disclosed, by which an engagement of these two members can be ensured as the hook member is moved in the vertical direction relative to the loop member.

In view of problems as have been described above, it is a principal object of the invention to provide a fastener used for a garment improved so as to ensure that a hook member should not be easily released from a loop member even if the hook member is moved in a vertical direction away with respect to the loop member.

The object set forth above is achieved, according to the invention, by a fastener used for a garment comprising a hook member and a loop member releasably engageable with each other so that the hook member may be progressively released from one end thereof held by fingers toward the other opposite end, the fastener being characterized in that the hook member comprises a base sheet having a top surface and a back surface and a plurality of hooks extending vertically from the top surface of the base sheet; and the back surface of the base sheet has a bonded region and a non-bonded region with respect to the garment, the non-bonded region being defined towards the one end of the hook member and extending over the full width of the base sheet transversely of the direction in which the hook member is progressively released from the loop member, and some of the hooks vertically extend from the top surface corresponding to the non-bonded region.

Embodiments of the present invention are described below with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view showing a disposable diaper provided with a fastener of the invention;

Fig. 2 is a fragmentary perspective view showing the fastener as partially broken away as viewed in a direction as indicated by arrows from a section taken along line II-II in Fig. 1.

Fig. 3 is a side view showing a hook member and a loop member as they have been engaged with each other;

Fig. 4 is a side view showing the hook member as it is being released from the loop member;

Fig. 5 is a fragmentary side view showing the hook member and the loop member as they have been engaged with each other; and

Fig. 6 is a fragmentary side view showing the hook member and the loop member as they are being pulled from their positions in Fig. 5 in horizontally opposite directions.

A fastener of the present invention used with a garment will be described more in detail with reference to the accompanying drawings for a specific embodiment in which the fastener is used with a disposable diaper, a typical example of the garment.

A disposable diaper 1 shown by Fig. 1 in a perspective view comprises a liquid-permeable topsheet 2, a liq-

uid-impermeable backsheet 3 and a liquid-absorbent core (not shown) disposed between these two sheets 2, 3 and longitudinally composed of a front body area 6, a rear body area 7 and a crotch area 8 extending between these two areas 6, 7. The fastener of the present invention comprises a fastening tape 10 and a target tape 11. A pair of the fastening tapes 10 respectively extends from transversely opposite side edges of the rear body area 7, and the target tape 11 is bonded to an outer surface of the backsheet 3 and circumferentially extends. Each of the fastening tapes 10 comprises a tape member 12 and a hook member 13 bonded to the top surface of the tape member 12. The target tape 11 has a loop member 14. A combination of these hook member 13 and loop member 14 is commonly known under the trade name of 'Velcro Tape' or 'Magic Tape' and both members 13, 14 cooperate with each other so that they are detachably fastened together and thereby reliably hold a diaper 1 on a wearer as the hook member 13 is forced against the loop member 14. To take off the diaper 1 from the body, an outer end 12B of the tape member 12 as will be described later is held by fingers and the hook member 13 is progressively released from the loop member 14 from the outer end 12B toward the inner end 12A opposed to the outer end 12B.

Fig. 2 is a fragmentary perspective view showing the fastener 10 as partially broken away as viewed in the direction as indicated by arrows from a section taken along line II-II in Fig. 1. The inner end 12A of the tape member 12 constituting the fastener 10 is inseparably bonded to the back surface, i.e., outer surface, of the backsheet 3 by means of hot melt type adhesive 15 and the outer end 12B of the tape member 12 serves as a grip zone used to release the fastening tape 10. The hook member 13 bonded to the top surface, i.e., inner surface, of the tape member 12 between the inner and outer ends 12A, 12B comprises a base sheet 16 and hooks 17 extending from the base sheet 16 in vertical direction and the base sheet 16 is inseparably bonded to the tape member 12 over a region 20 thereof except an outer end region 18 defined by a length W and fully extending over a width of the sheet 16 (refer also to Fig. 1) by means of hot melt type adhesive 21. The outer end region 18 defines a non-bonded zone with respect to the tape member 12. 2 - 20 pieces of the hook 17, preferably 5 - 15 pieces of the hook 17 per 5mm length are arranged on the base sheet 16 longitudinally as well as transversely thereof and the outer end region 18 is provided with the hooks 17 arranged in 2 - 20 rows each extending transversely thereof. It should be understood that the top- and backsheets 2, 3 are bonded together by means of hot melt adhesive 22 along transversely opposite side edges of the diaper 1.

Fig. 3 is a side view similar to Fig. 5, illustrating a state in which the hook member 13 is pressed in the vertical direction against the loop member 14 and brought into engagement with the loop member 14. In this state, a plurality of the vertically oriented hooks 17 are merely inserted into spaces defined among a plural-

ity of the loops 25 which are also oriented in the substantially vertical direction and therefore a relatively small number of the hooks 17 are effectively engaged with the correspondingly small number of the loops 25.

Fig. 4 is a schematic diagram illustrating a state after the fastening tape 10 has moved upward in vertical direction from its position shown by Fig. 3 relatively to the loop member 14. As illustrated, the hooks 17 follow such a movement of the tape fastener 10 and rather smoothly leave the spaces defined among the loops 25 so far as the region 20 of the hook member 13 bonded to the tape member 12 is concerned. In the outer end region 18 (non-bonded region), on the other hand, the movement of the fastening tape 10 causes the hooks 17 to be tilted so as to be laterally brought into engagement with the corresponding loops 25 and thereby the hook member 13 is prevented from being released away from the loop member 14. Obviously, the number of the rows of the hook 17 associated with the outer end region 18 of the base sheet 16 may be selected from a range of 2 - 20 and accordingly the fastening tape 10 can be positively released from the target zone 11 without any difficulty.

Garments with which the fastener of the present invention can be used include, in addition to the disposable diaper 1 illustrated as a typical example of the garments, diaper covers, sanitary napkins, bandages and other various garments. In the hook member 13 used with these garments, the base sheet 16 preferably has a bending resistance less than 0.1g as measured by a Gurley Stiffness Tester. While the hook member 13 has been described and illustrated as being attached to the diaper 1 with interposition of the tape member 12, it is also possible to attach the hook member 13 directly to the diaper 1 at a desired location. Bonding of the diaper's various components such as the hook member 13 and the loop member 14 may be achieved by utilizing, in addition to adhesive such as hot melt adhesive having appropriate softness, heat-sealing so far as components to be bonded are heat-sealable.

With the fastener of the invention, there is no apprehension that the hook member might be readily and unintentionally released off from the loop member even when the hook member moves in the vertical direction away with respect to the loop member with which the hook member has been engaged, because the outer end region of the hook member is left as the non-bonded region with respect to the base sheet to which the remaining region of the hook member is bonded and the outer end region is provided with 2 - 20 rows of the hooks.

Claims

1. A fastener used for a garment comprising a hook member (13) and a loop member (14) releasably engageable with each other so that the hook member may be progressively released with one end thereof held by fingers toward the other opposite

end, the fastener being characterised in that:

the hook member (13) comprises a base sheet (16) having a top surface and a back surface and a plurality of hooks (17) extending vertically from the top surface of the base sheet; the back surface of the base sheet comprises a bonded region (20) and a non-bonded region (18) with respect to the related garment, the non-bonded region (18) being defined towards the one end of the hook member and extending over the full width of the base sheet transversely of the direction in which the hook member is progressively released from the loop member, and some of the hooks (17) vertically extend from the top surface corresponding to the non-bonded region (18).

2. The fastener according to Claim 1, wherein the top surface of the base sheet corresponding to the non-bonded region (18) is provided with two or more rows of hooks (17) each extending transversely of the direction in which the hook member is progressively released.
3. The fastener according to Claim 1 or 2, wherein the base sheet (16) has a bending resistance less than 0.1g as measured by a Gurley Stiffness Tester.
4. The fastener according to any one of Claims 1 through 3, wherein the garment is any one of a disposable diaper and a diaper cover.

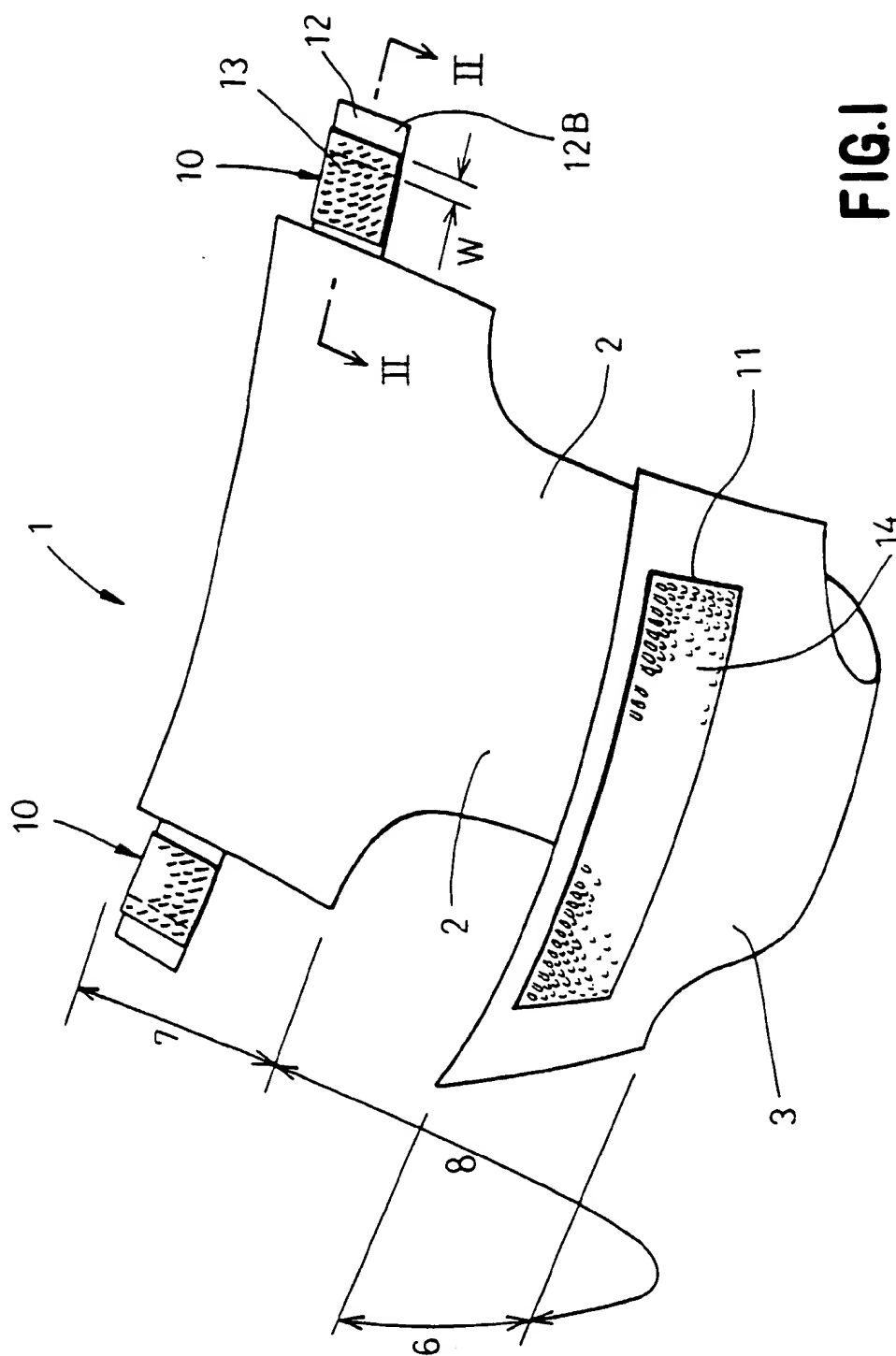
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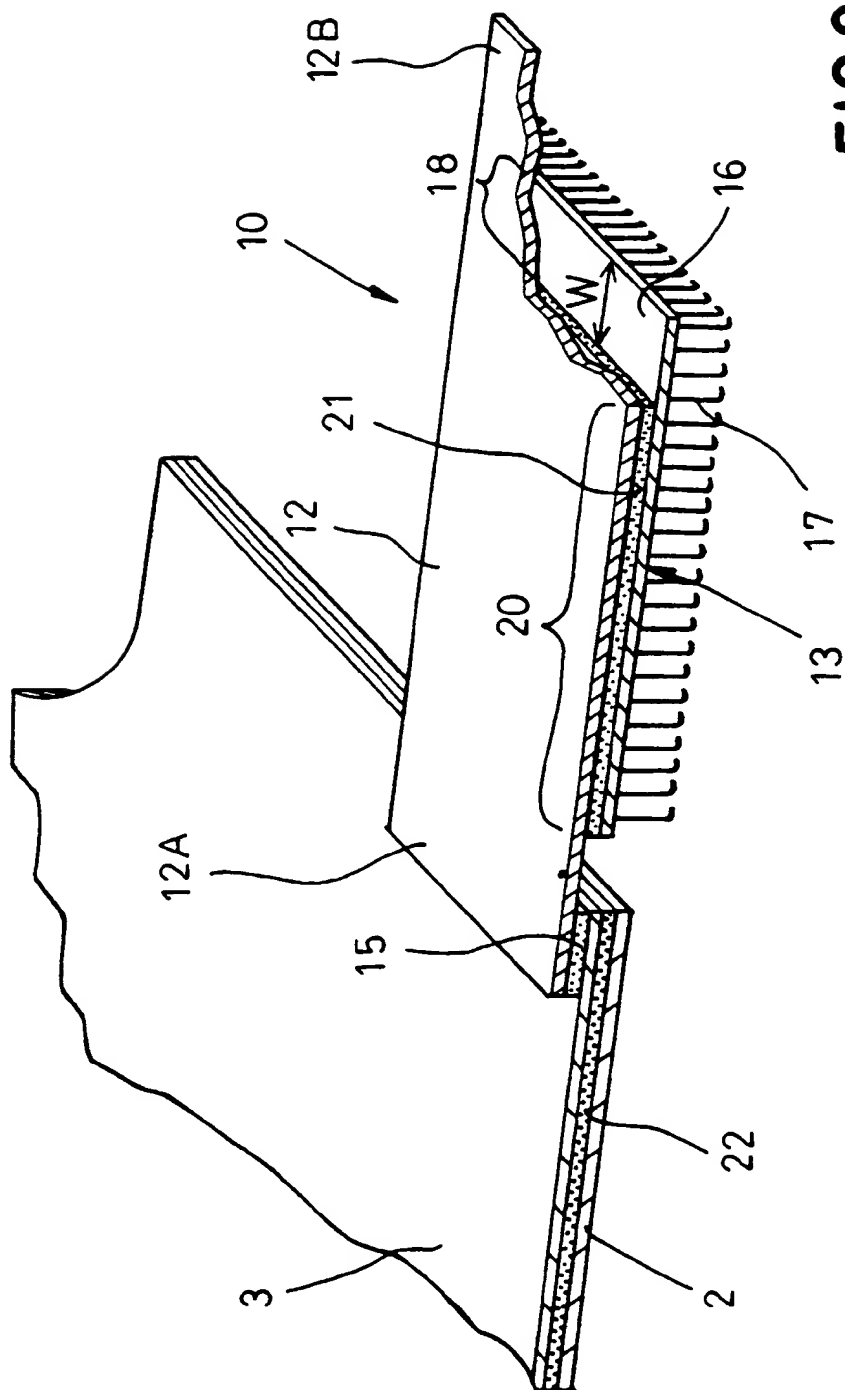


FIG. 2

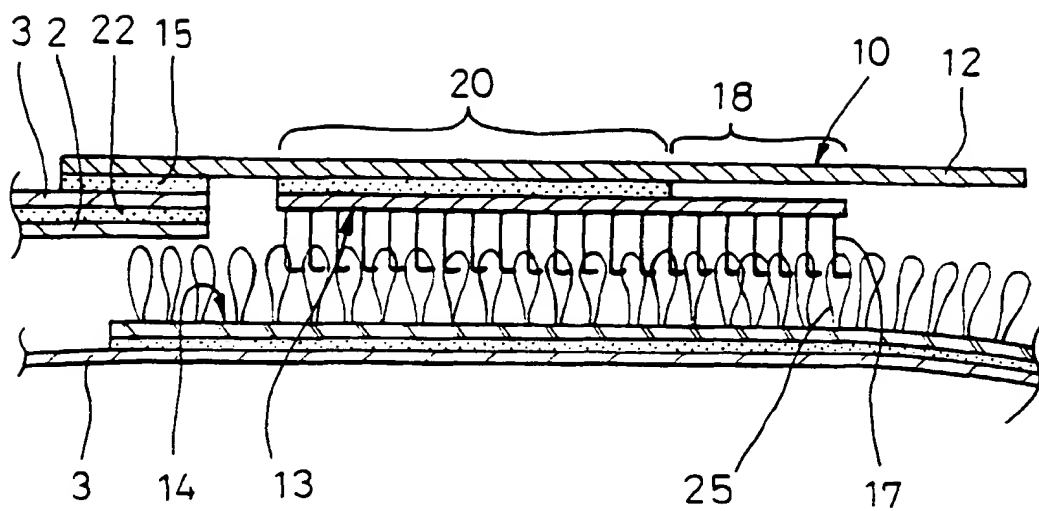


FIG.3

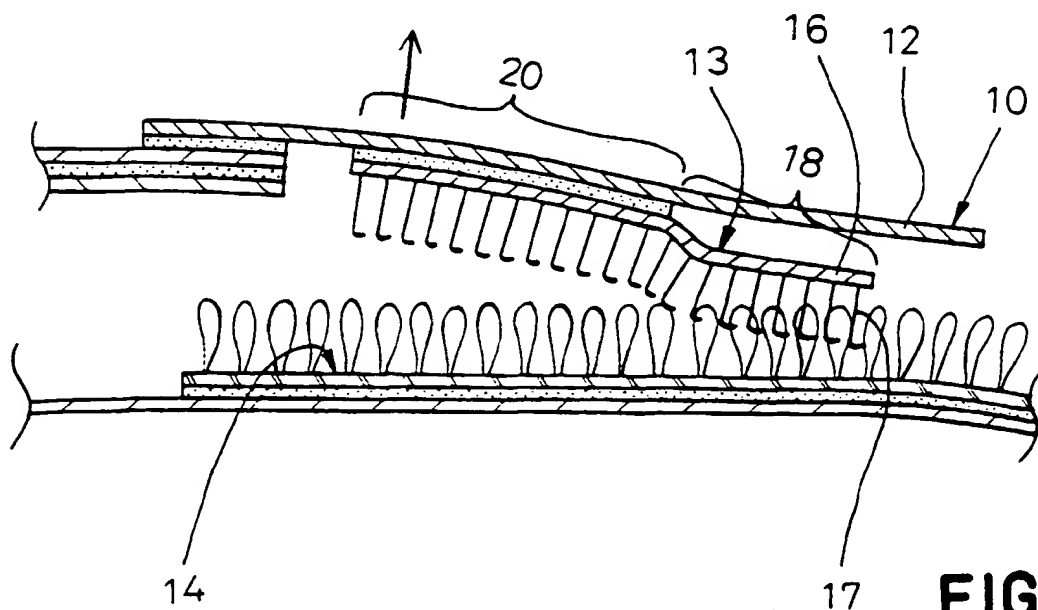


FIG.4

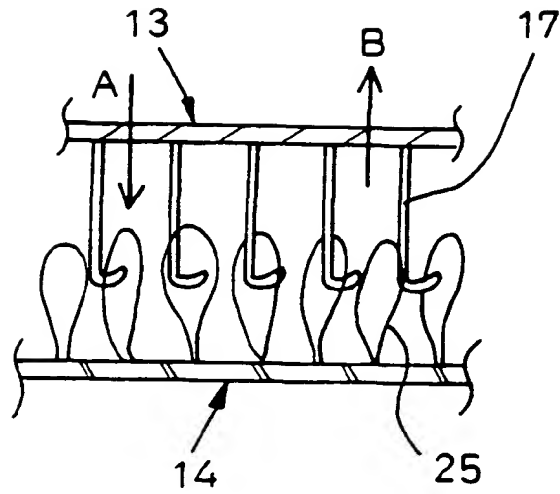


FIG.5

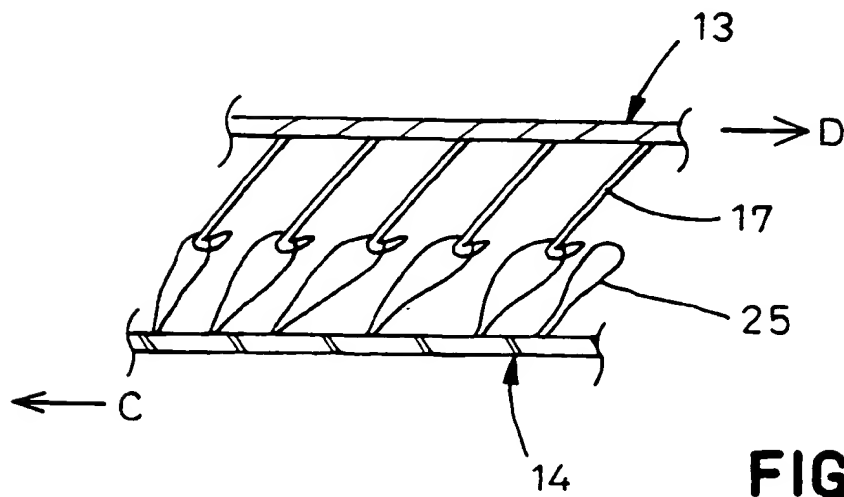
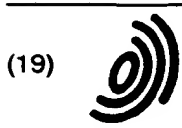


FIG.6



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and non-bonded region (18) with respect to the diaper (1) and the non-bonded region (18) is defined towards the one end from which the hook member (13) can be progressively released from the loop member (14) toward the other opposite end.

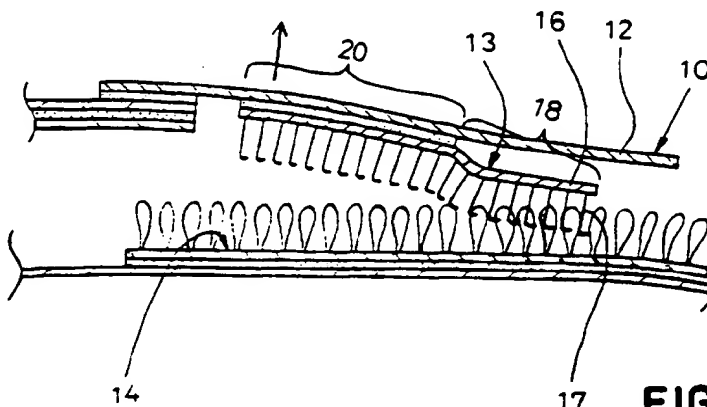


FIG.4

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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 9120

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	WO 90 07313 A (WORLDWIDE BABY BASICS INFANT W) 12 July 1990	1,2	A61F13/62
Y	* page 17, line 5 - line 8; figures 6,7,12-14 *	3,4	
Y	GB 2 284 742 A (KIMBERLY CLARK CO) 21 June 1995 * page 23, line 19 - line 23 *	3,4	
A	US 5 137 526 A (COATES FREDRICA) 11 August 1992		
A	US 5 049 145 A (FLUG RACHAEL) 17 September 1991		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A61F
Place of search		Date of completion of the search	Examiner
THE HAGUE		9 November 1998	Sánchez y Sánchez, J
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